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Cement asphalt mortar modelling and its influence on high-speed train–bridge system in presence of moderate earthquakes and service loading

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ABSTRACT

The cement asphalt mortar (CAM) layers, sandwiched between the concrete track slab and concrete base in China railway track system (CRTS) II slab track, act as a cushion to provide the elasticity for train–bridge system subjected to the earthquakes action and service loading. In this study, based on the multiscale modeling technology, a high-speed vehicle-ballastless slab track–bridge interaction model is developed. The effects of the CAM layer on dynamic responses of the system are also analyzed. According to “The tentative requirements for the cement emulsified asphalt mortar in China railway track system II typed slab track of passenger dedicated railway,” when the Young’s modulus of CAM is 7.0–10.0 GPa, the results indicate that the CAM layer effectively influence the dynamic response of the train–bridge system and traffic safety.